SWRCB Groundwater Workshop
Statewide Monitoring

January 22, 2014

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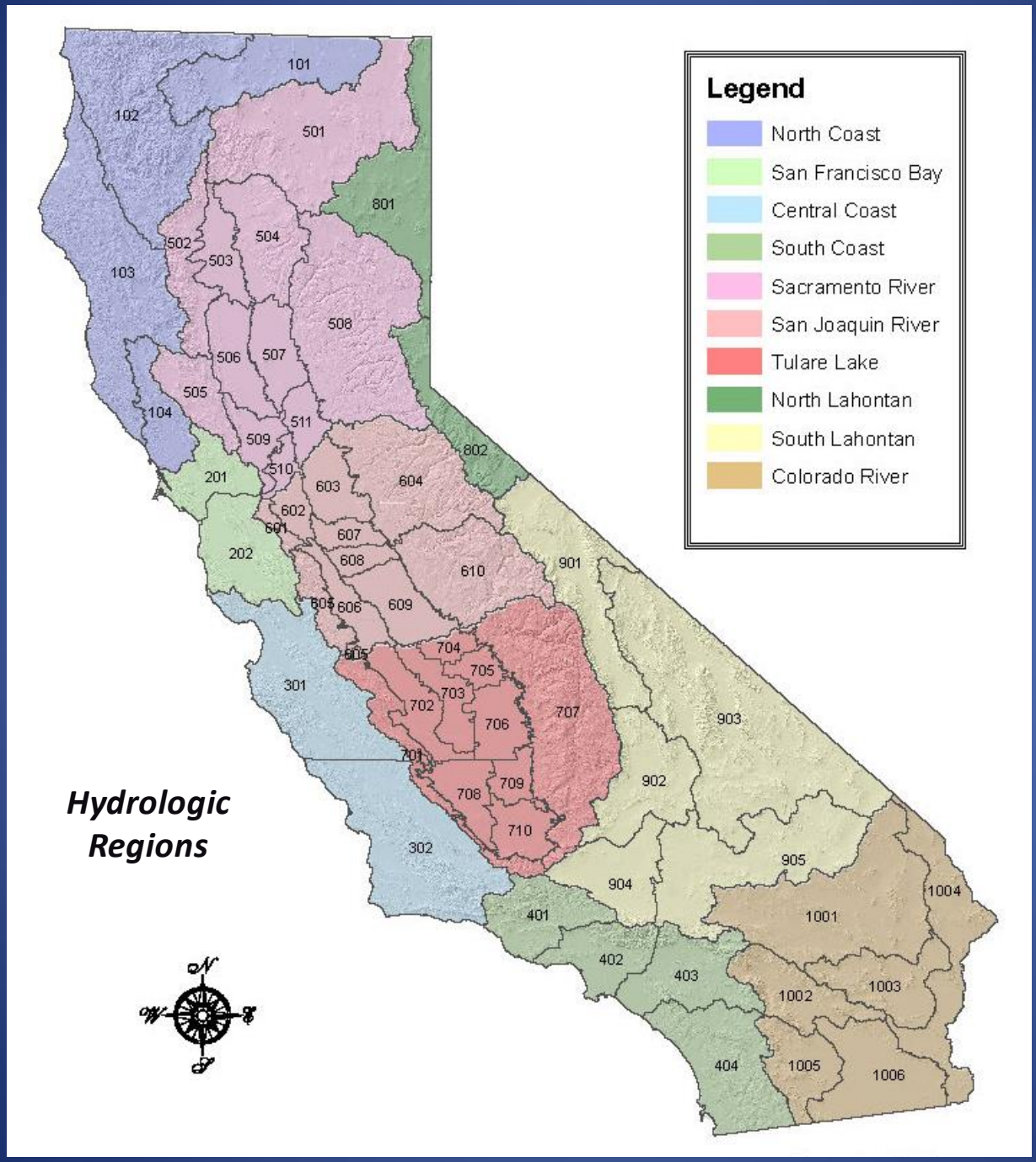
Department of Water Resources

Statewide Groundwater

- Use/supply
- Monitoring
  - Well Completion Reports
  - CASGEM
  - Databases
- Trends
- Management


Legend
North Coast
San Francisco Bay
Central Coast
South Coast
Sacramento River
San Joaquin River
Tulare Lake
North Lahontan
South Lahontan
Colorado River
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Hydrologic Regions
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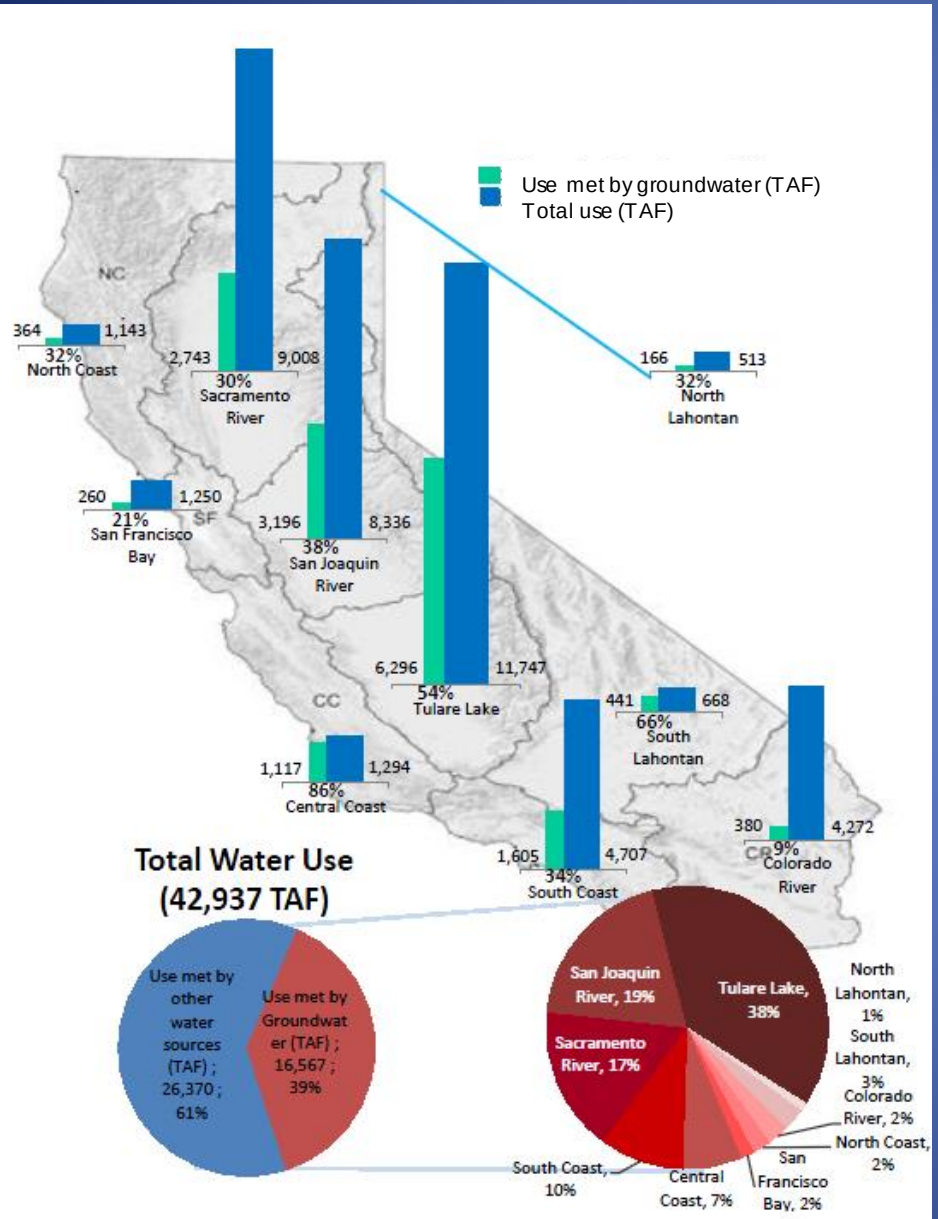
Groundwater Use in California Today

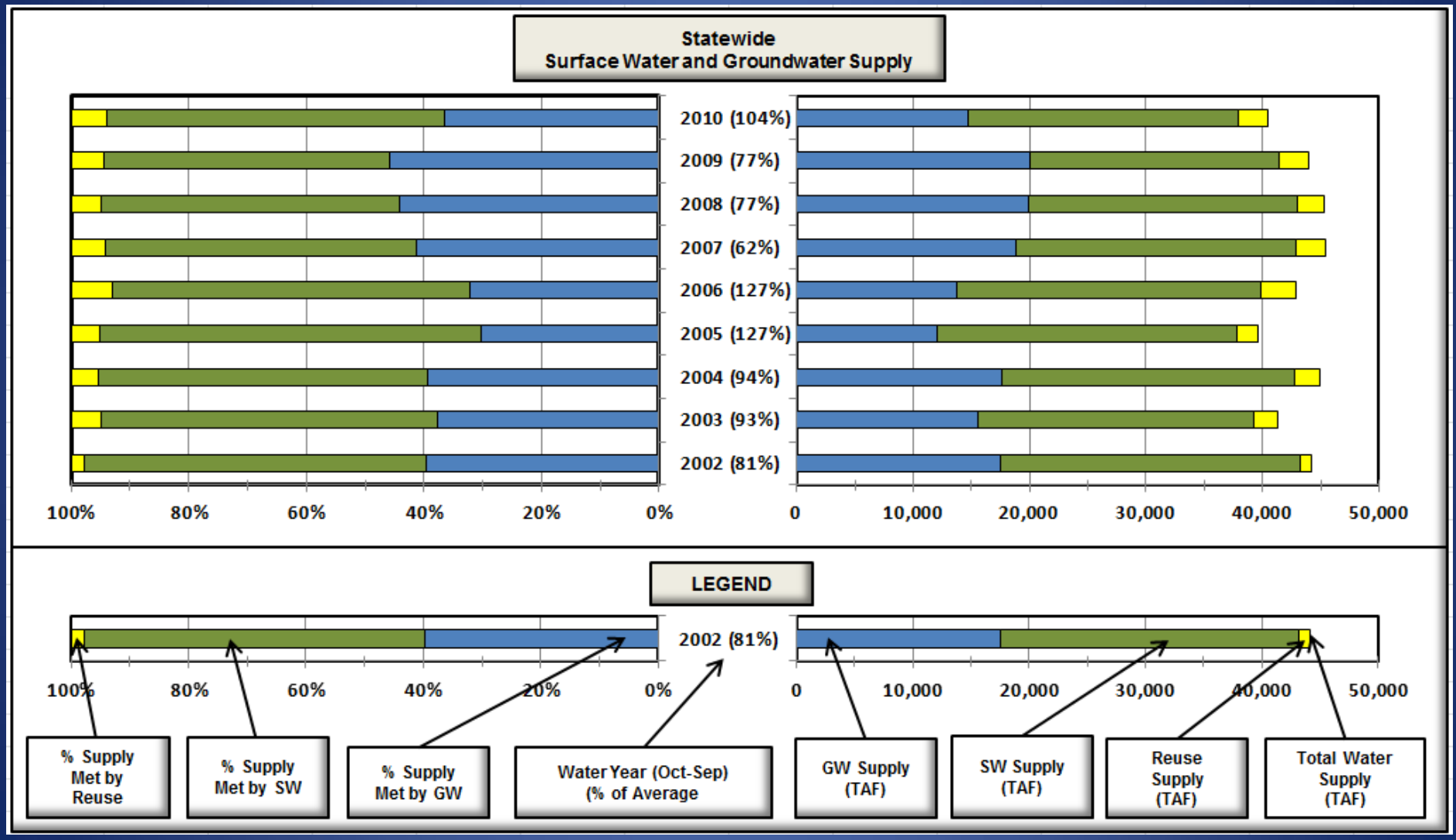


Groundwater accounts for about 40% of CA water supply

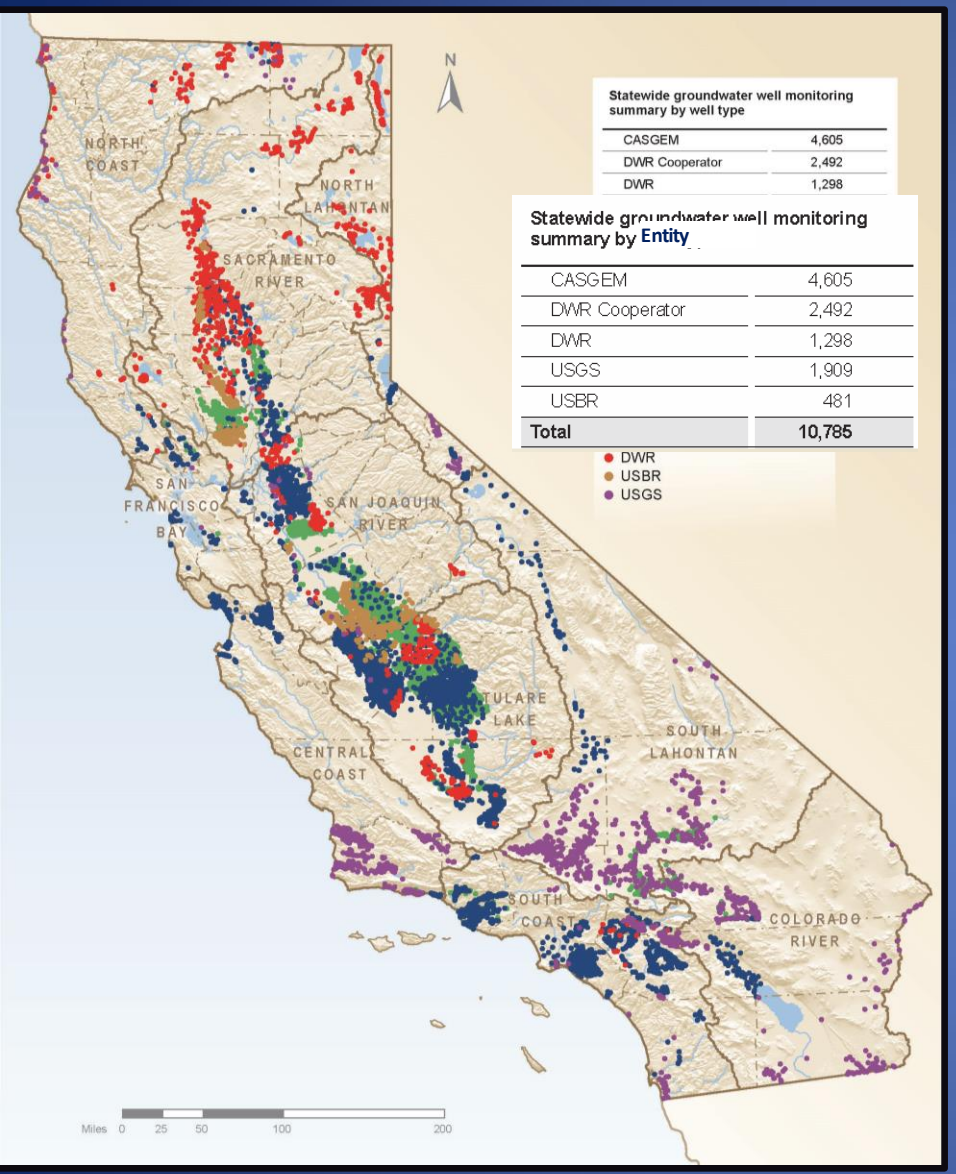
Regions with highest use:

- Tulare Lake 38%
- San Joaquin River 19%
- Sacramento River 17%
- South Coast 10%

Annual Groundwater Supply Trends 2002 - 2010



Groundwater Level Monitoring

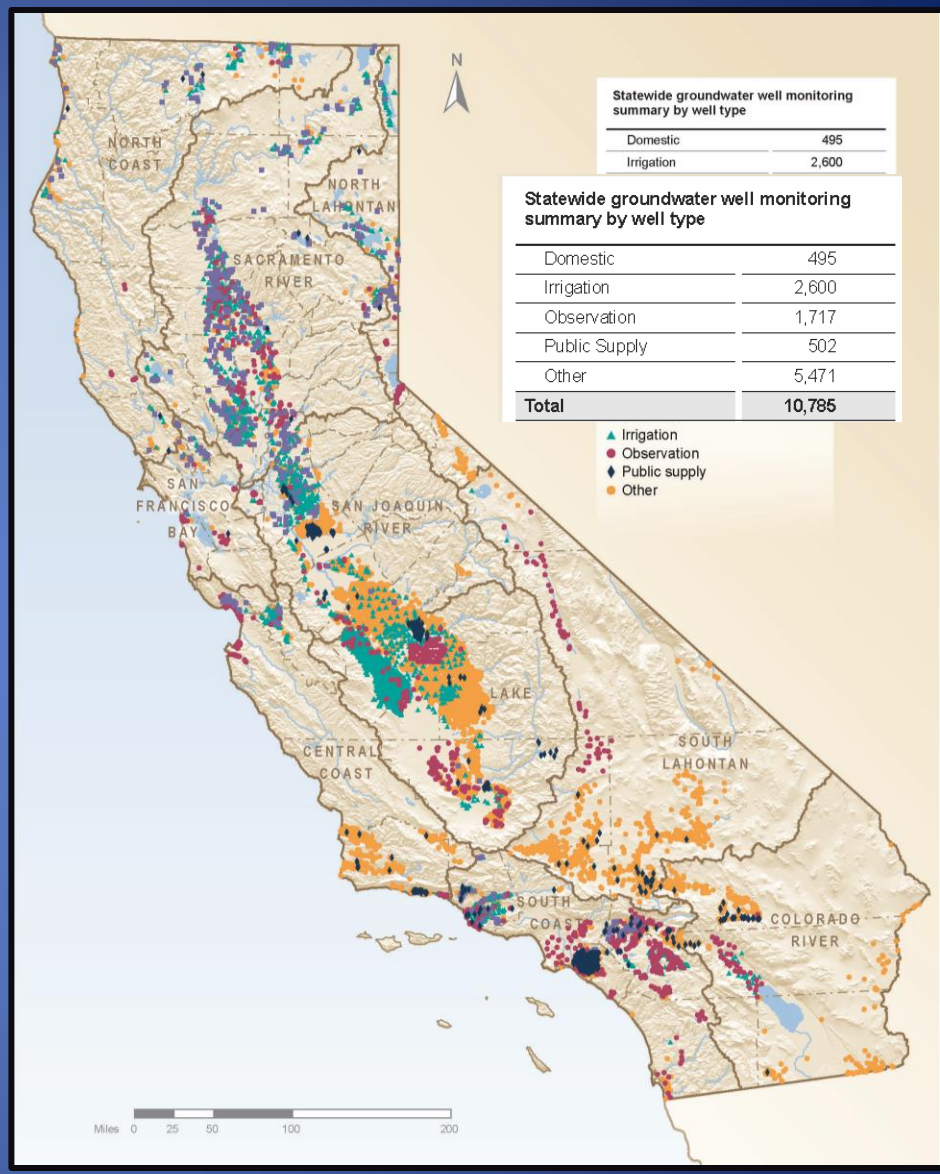


Statewide groundwater well monitoring summary by well type

CASGEM	4,605
DWR Cooperator	2,492
DWR	1,298

Statewide groundwater well monitoring summary by Entity

CASGEM	4,605
DWR Cooperator	2,492
DWR	1,298
USGS	1,909
USBR	481
Total	**10,785**



Statewide groundwater well monitoring summary by well type

Domestic	495
Irrigation	2,600

Statewide groundwater well monitoring summary by well type

Domestic	495
Irrigation	2,600
Observation	1,717
Public Supply	502
Other	5,471
Total	**10,785**

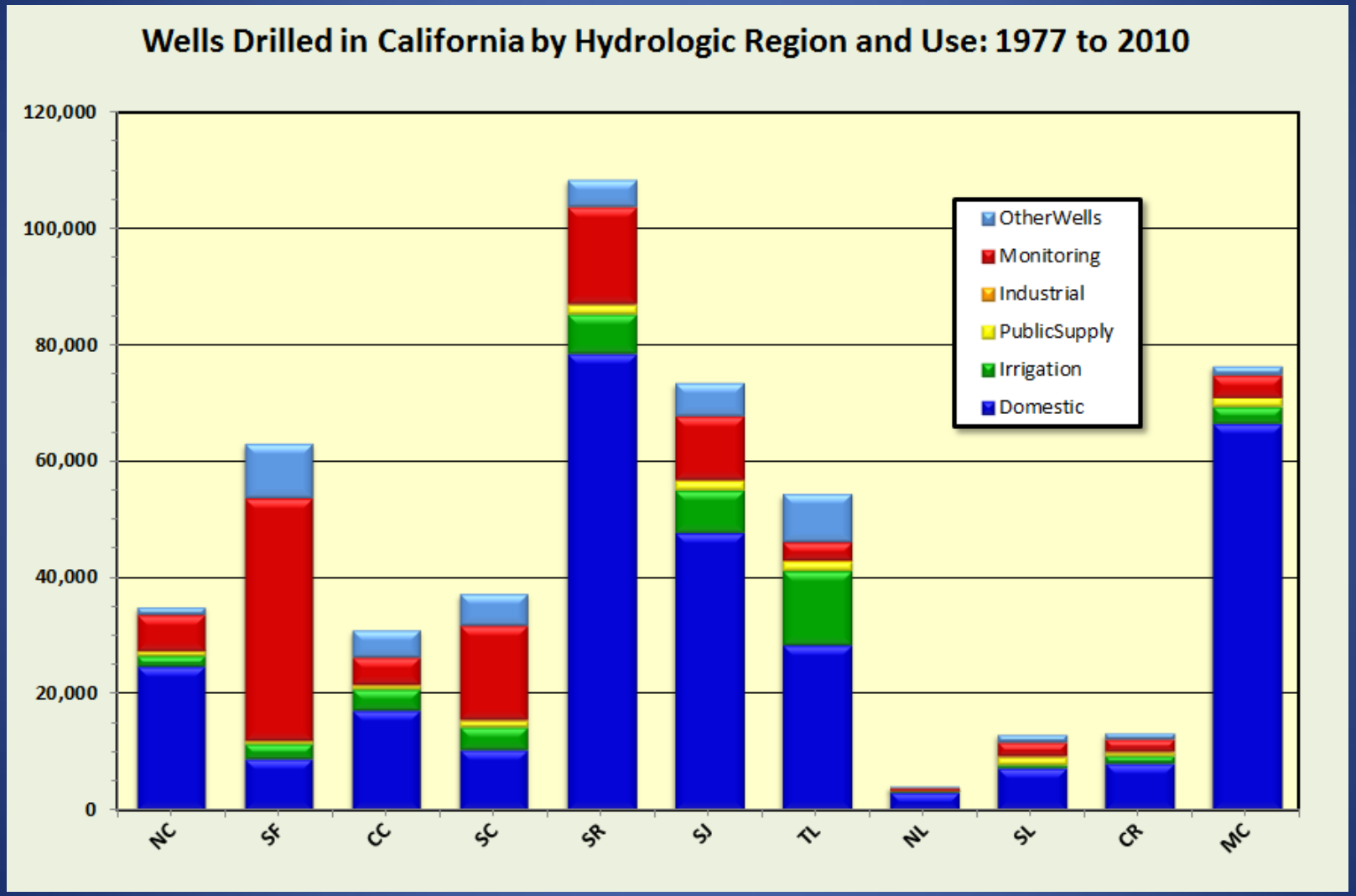
DWR in cooperation with local, state, and federal agencies, has collected groundwater elevation data for many decades = Water Data Library (WDL).

DWR's Well Completion Reports

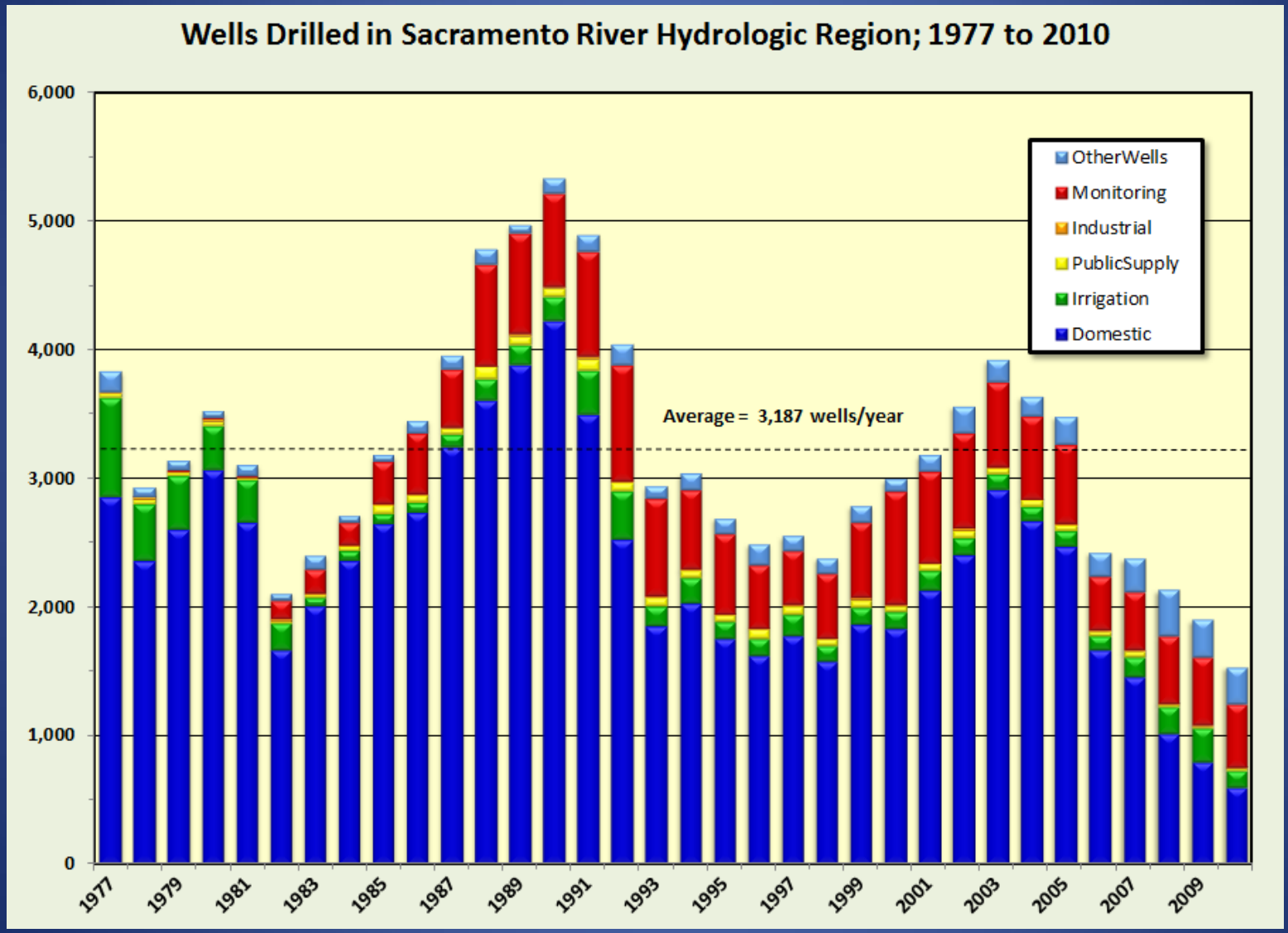
- Well location
- Well log
  - Type of construction
  - Sealing methods
  - Details of perforations
- Logs are confidential

Number of WCRs by HR and Type of Use 1977 – 2010

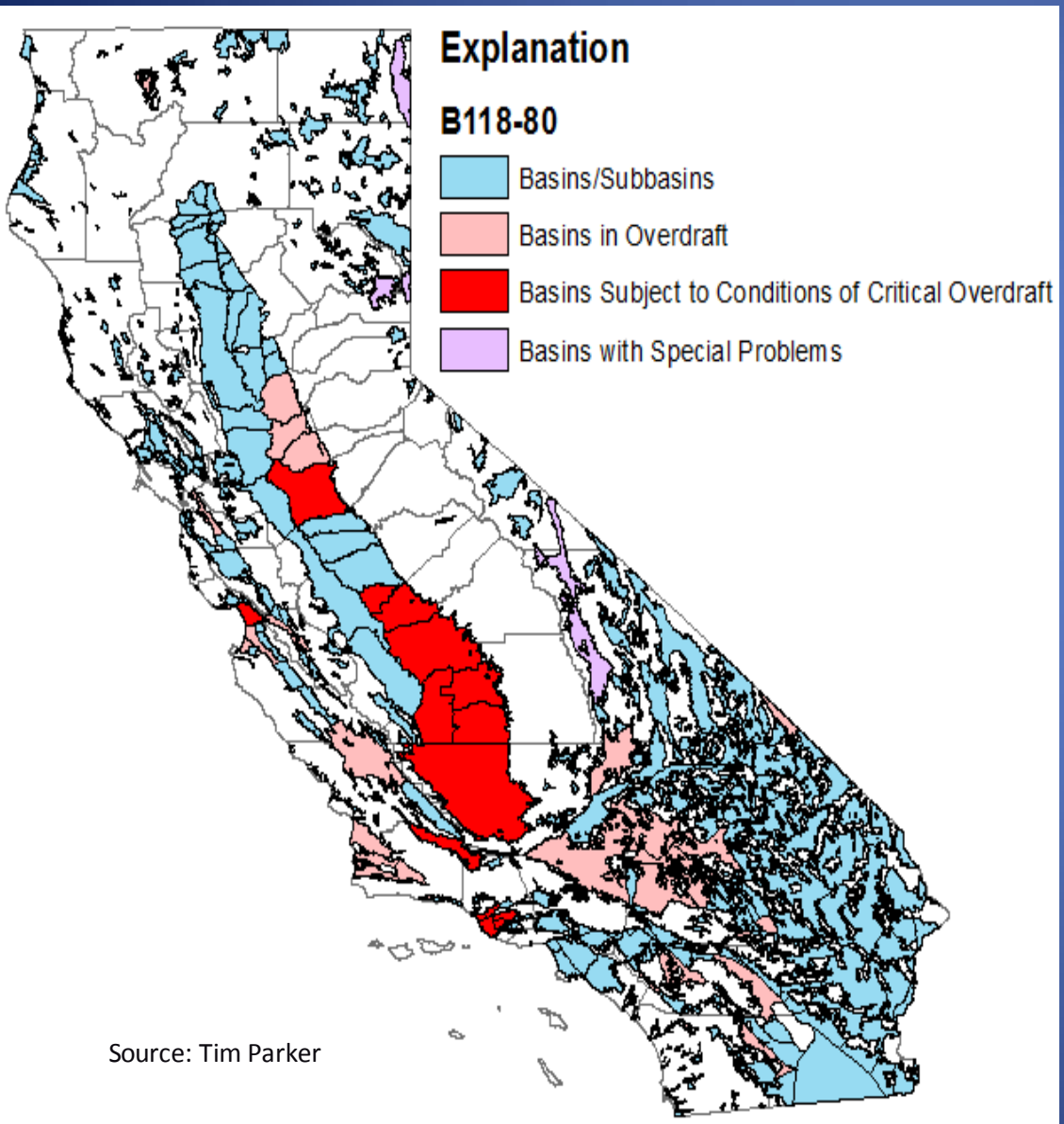
Hydrologic Region	Well Use						Total
	Domestic	Irrigation	Public Supply	Industrial	Monitoring	Other	
NC	24,710	1,899	689	150	6,155	1,352	34,955
SF	8,951	2,594	356	154	41,487	9,399	62,941
CC	17,137	3,849	501	80	4,880	4,480	30,927
SC	10,414	4,067	1,029	260	15,935	5,444	37,149
SR	78,260	6,781	1,628	368	16,514	4,795	108,346
SJ	47,789	7,280	1,461	225	11,031	5,661	73,447
TL	28,466	12,786	1,581	181	3,211	8,097	54,322
NL	3,064	319	68	40	366	212	4,069
SL	7,394	521	1,292	196	2,329	1,380	13,112
CR	8,096	1,430	472	85	2,292	826	13,201
Total Well Logs	234,281	41,526	9,077	1,739	104,200	41,646	432,469


Wells Drilled in California by Hydrologic Region and Use: 1977 to 2010
120,000
100,000
80,000
60,000
40,000
20,000
0
NC
SF
CC
SC
SR
SJ
TL
NL
SL
CR
MC
OtherWells
Monitoring
Industrial
PublicSupply
Irrigation
Domestic

Example: Well Infrastructure by Year and Type of Use



Overdraft in 1980



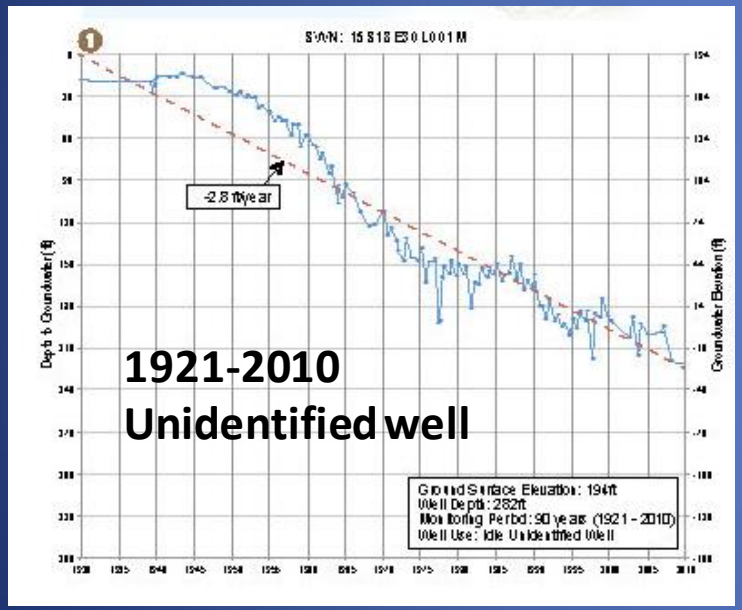
Source: Tim Parker

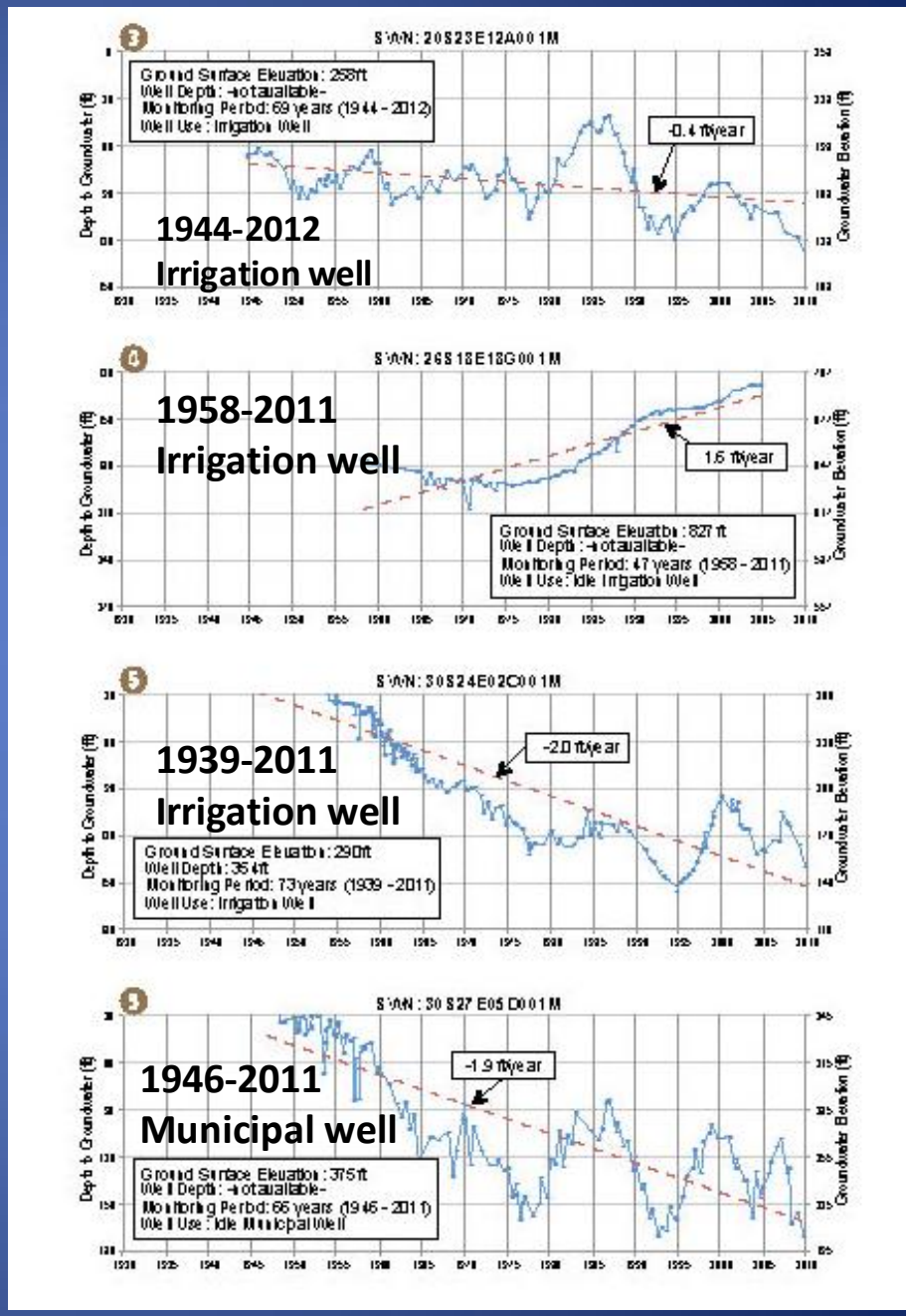
1980 DWR Bulletin 118:

- 12 basins subject to critical overdraft
- 31 basins with evidence of overdraft
- 5 basins with special problems

Today - 30 years later - many of these basins show signs of continued overdraft and impacts have not yet been adequately addressed

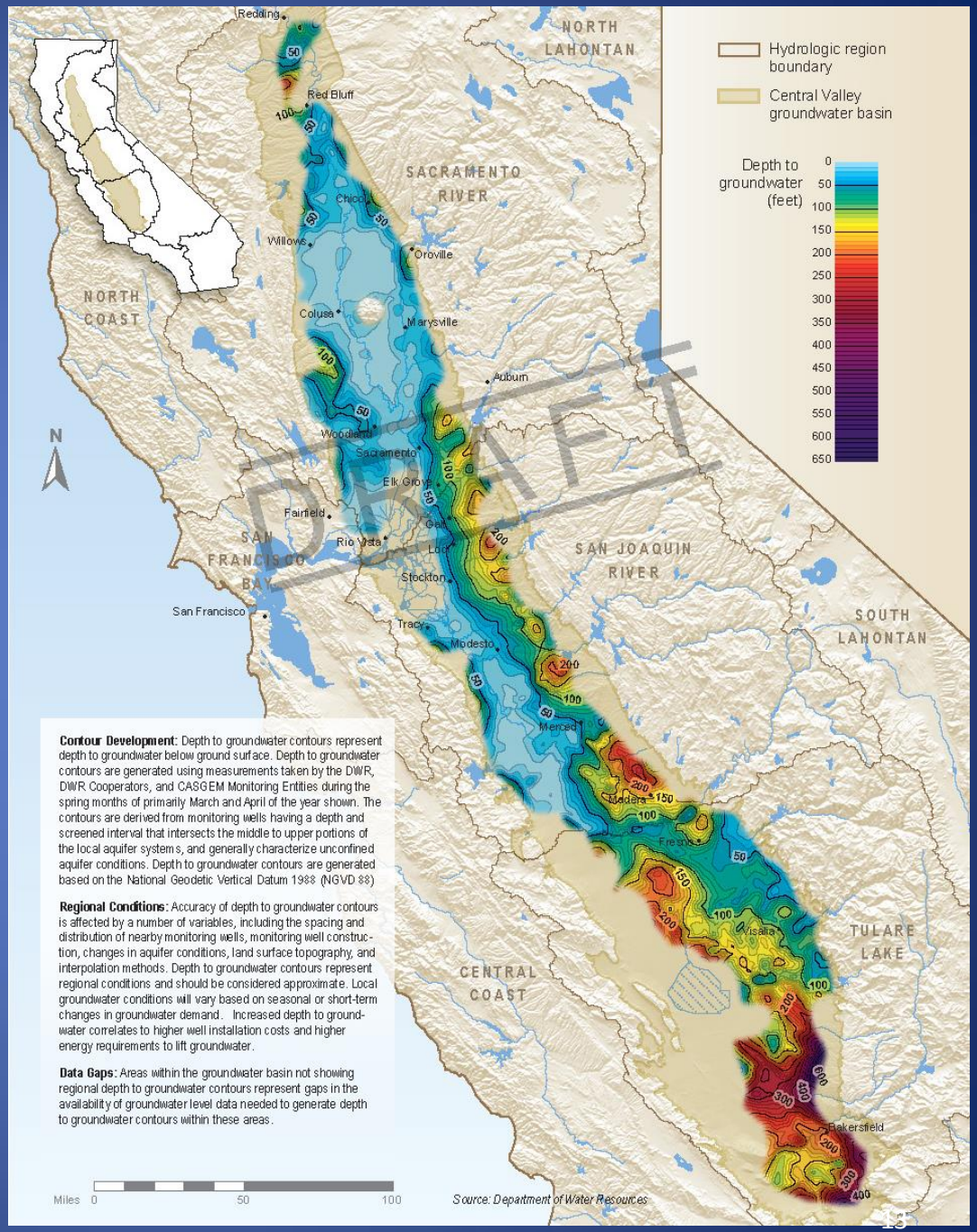
Groundwater Level Trends



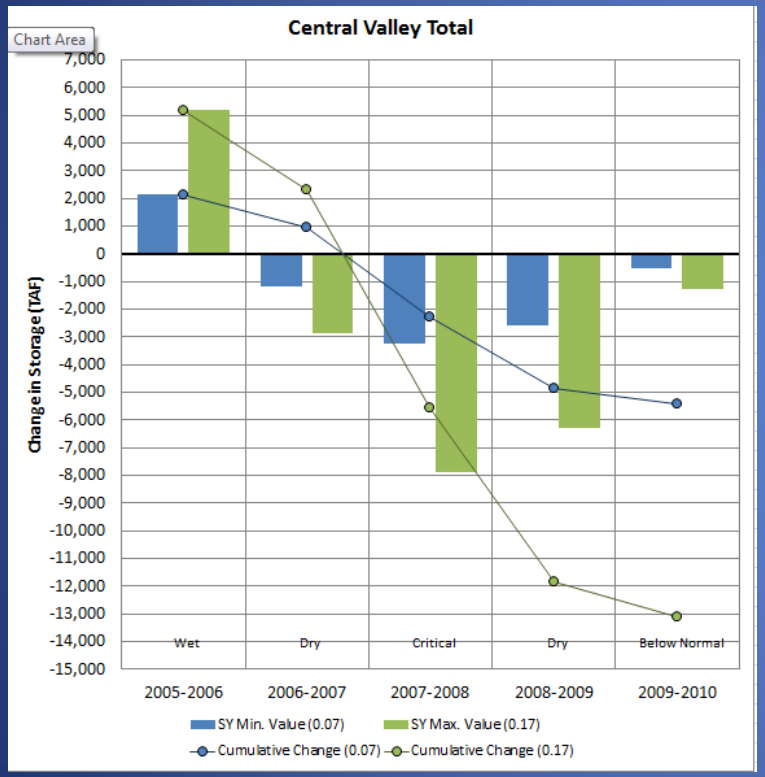


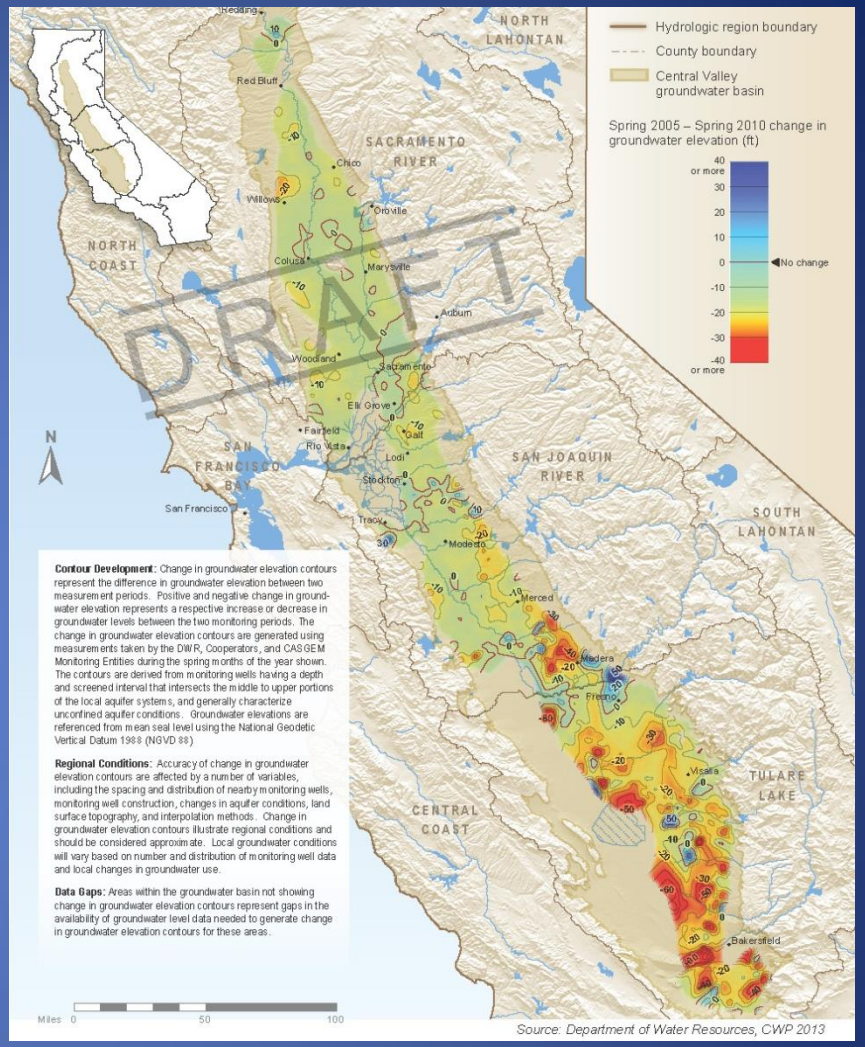
Depth to Groundwater Contours

Spring 2010
Central Valley



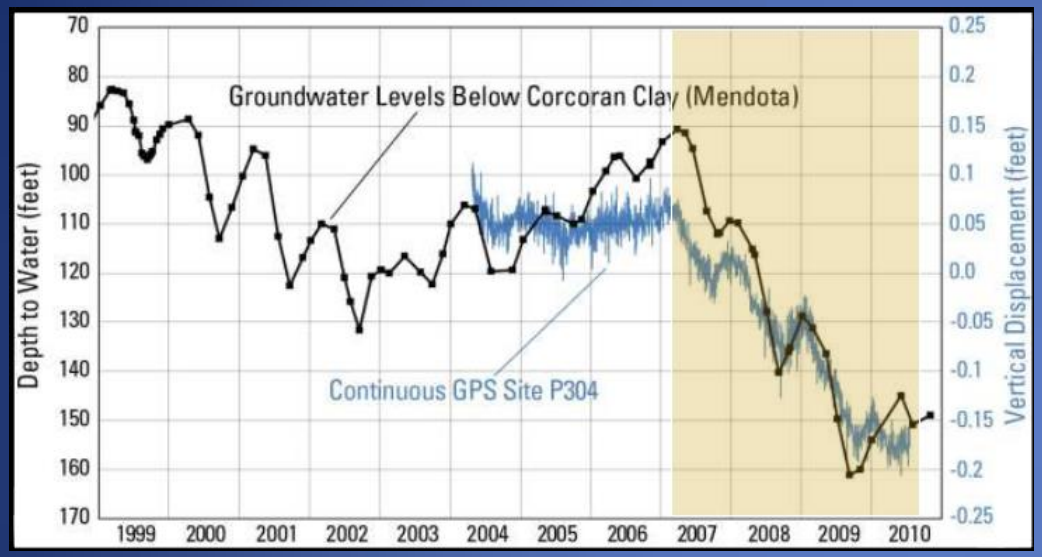
Spring 2005 – 2010 Change in Groundwater Storage Central Valley



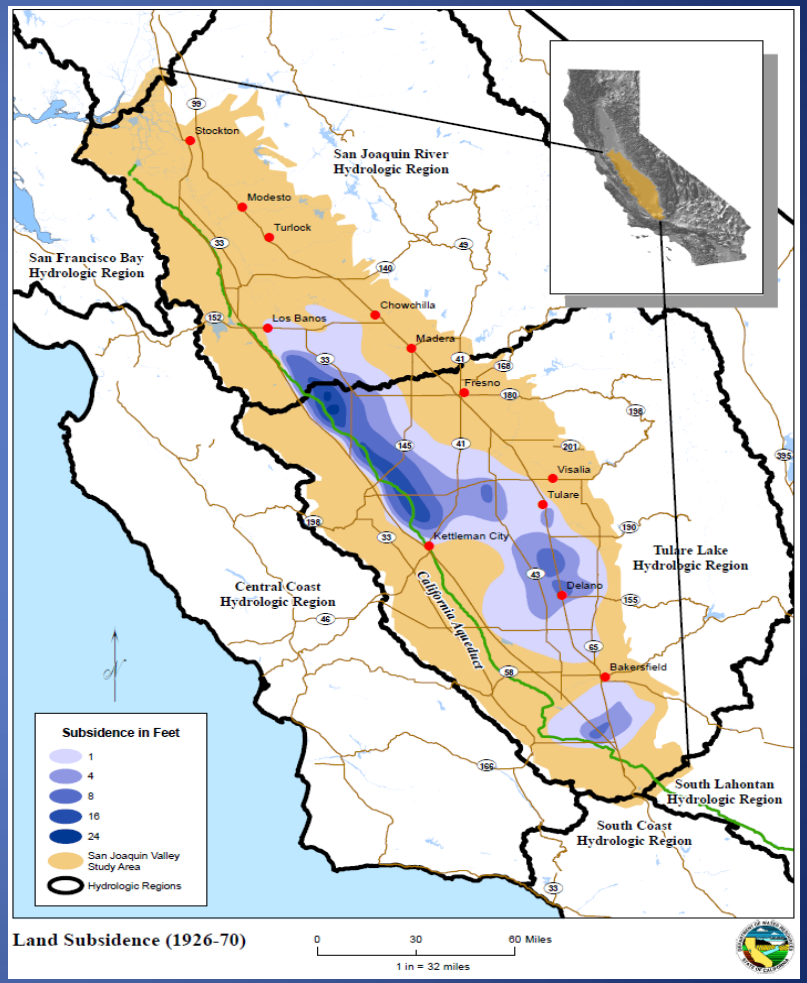


-5.4 to -13.1 MAF Cumulative Change

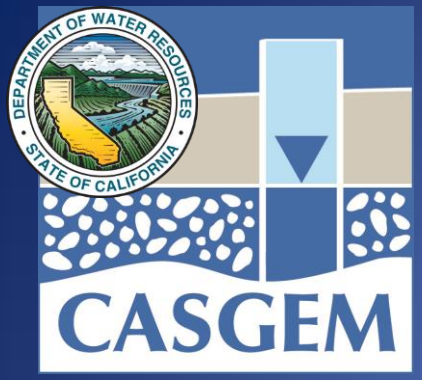
Land Subsidence



Reference: Figure from USGS Presentation (2011) Subsidence Resumes in the Central Valley. Data on figure: land elevation changes from UNAVCO Station P304 and water level data from Luhdorff and Scalmanini Consulting Engineers.



Renewed land subsidence threatens infrastructure, buildings, water delivery systems, and long-term water supply capacity.

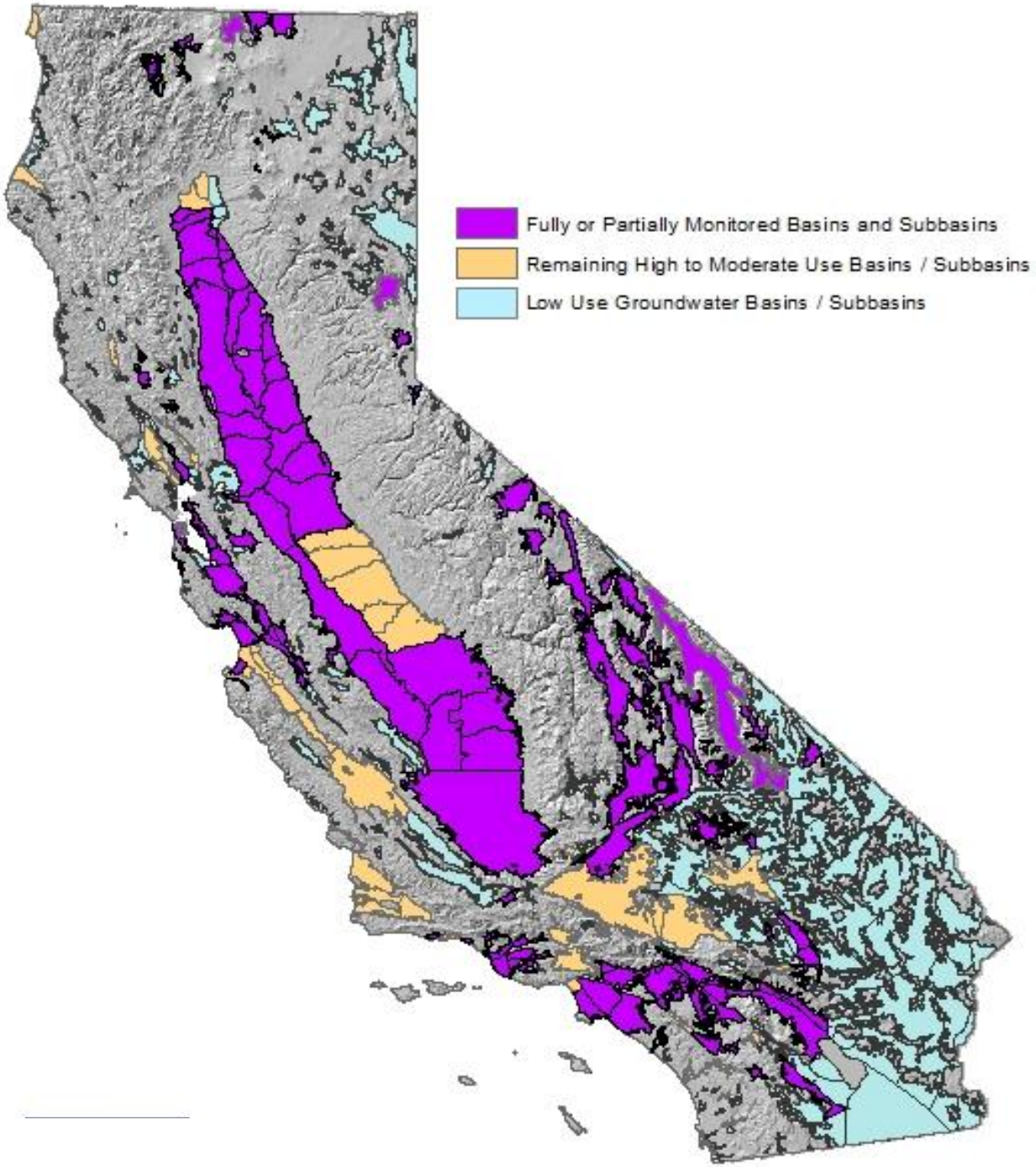


California Statewide Groundwater Elevation Monitoring Program (CASGEM)

- Initiated 2011 - First Statewide program to collect, compile and share groundwater elevation data
- Establish permanent, locally-managed monitoring programs in all 515 alluvial groundwater basins
- Data readily and widely available to the public
- CASGEM data augments groundwater data collected under other programs

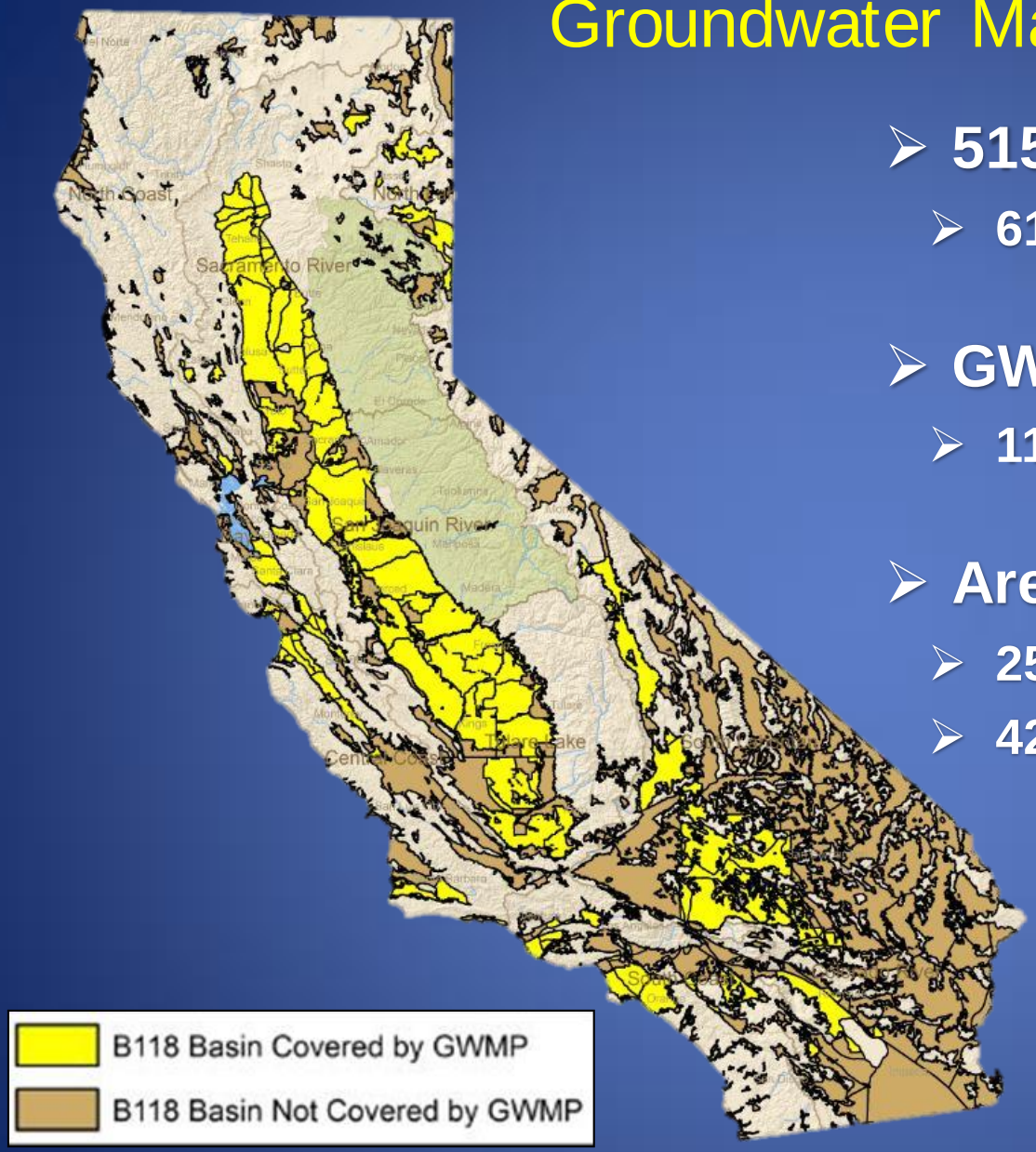
CASGEM Accomplishments

- 171 Basins/Subbasins represented (out of ~350)
- 71 Designated monitoring entities
- 2,723 CASGEM wells included in the CASGEM online system
- 44,744 groundwater elevation readings since July 1, 2011
- 101,247 total readings for CASGEM wells to date, including pre-CASGEM historical data predating
- WDL-GW database expanded and modified to incorporate CASGEM data


Fully or Partially Monitored Basins and Subbasins
Remaining High to Moderate Use Basins / Subbasins
Low Use Groundwater Basins / Subbasins

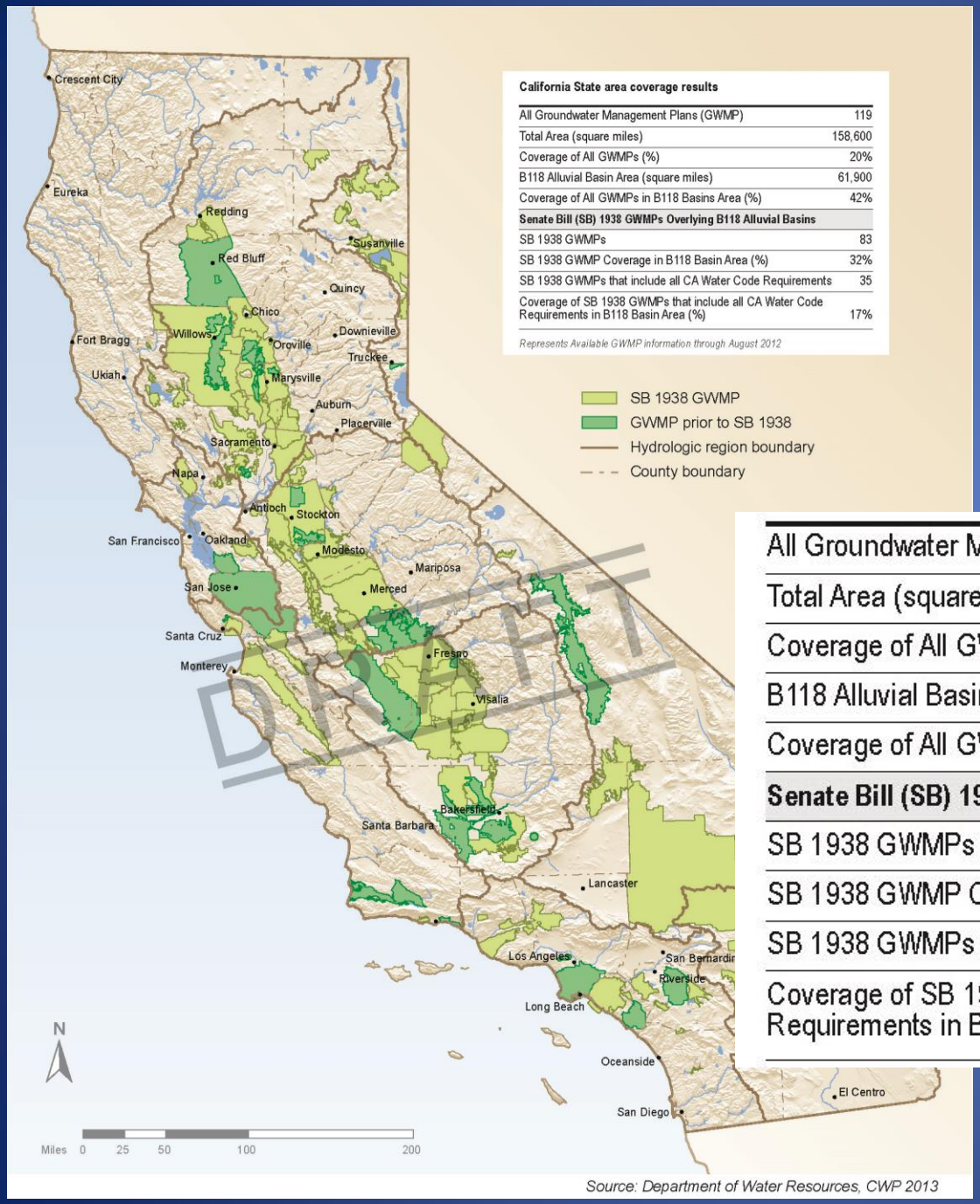
CASGEM

Groundwater Management Plans



- **515 Groundwater Basins**
  - **61,900 square miles**
- **GWMP Coverage**
  - **119 Plans**
- **Area Coverage**
  - **25,900 square miles**
  - **42% of GW Basin area**

Groundwater Management Planning



California State area coverage results

All Groundwater Management Plans (GWMP)	119
Total Area (square miles)	158,600
Coverage of All GWMPs (%)	20%
B118 Alluvial Basin Area (square miles)	61,900
Coverage of All GWMPs in B118 Basins Area (%)	42%
Senate Bill (SB) 1938 GWMPs Overlying B118 Alluvial Basins	
SB 1938 GWMPs	83
SB 1938 GWMP Coverage in B118 Basin Area (%)	32%
SB 1938 GWMPs that include all CA Water Code Requirements	35
Coverage of SB 1938 GWMPs that include all CA Water Code Requirements in B118 Basin Area (%)	17%

Represents Available GWMP information through August 2012

Source: Department of Water Resources, CWP 2013

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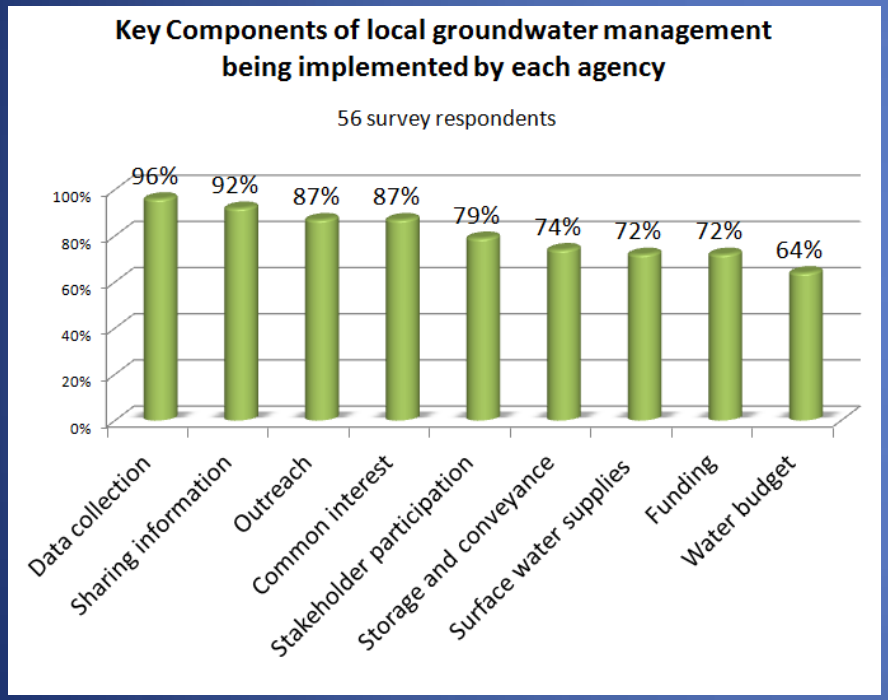
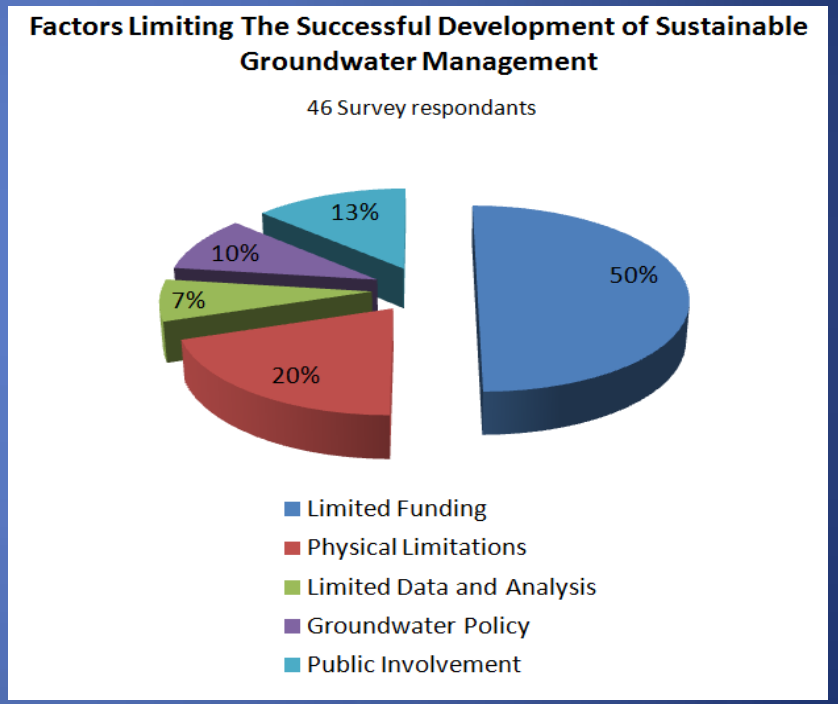
DWR/ACWA GW Management Survey

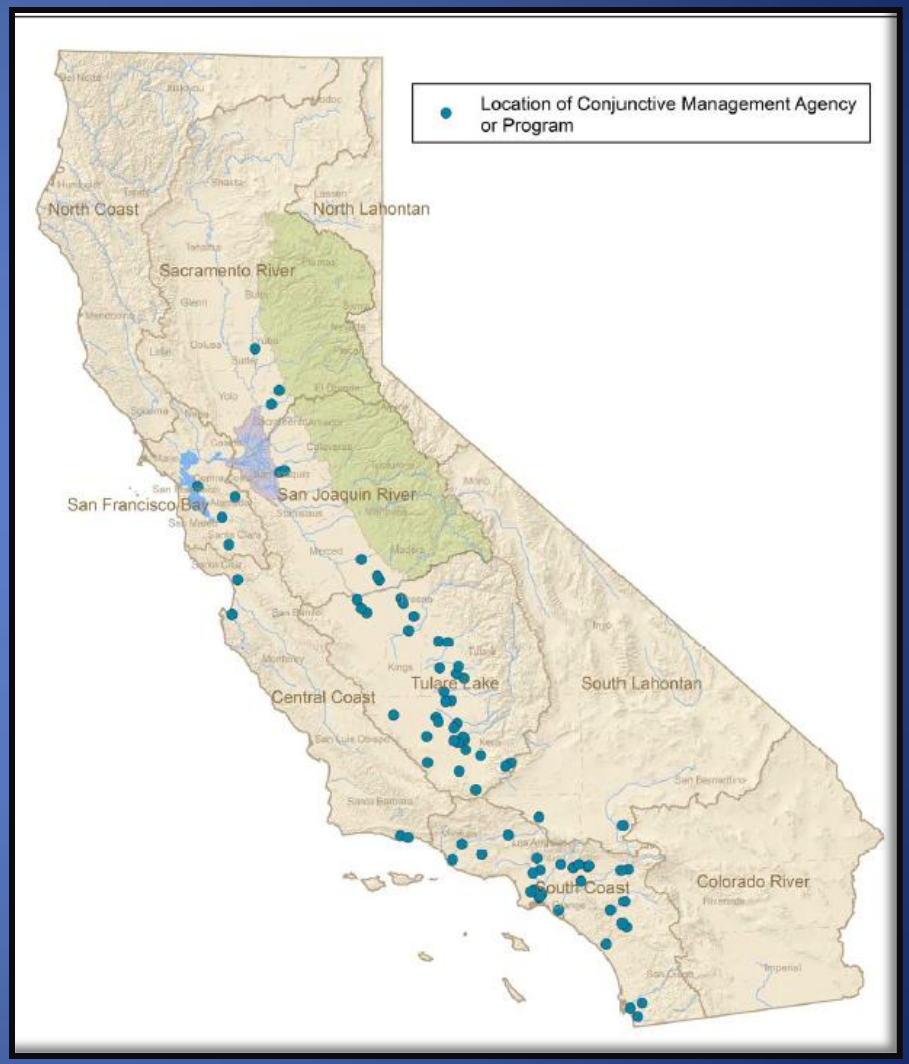
What's Working?



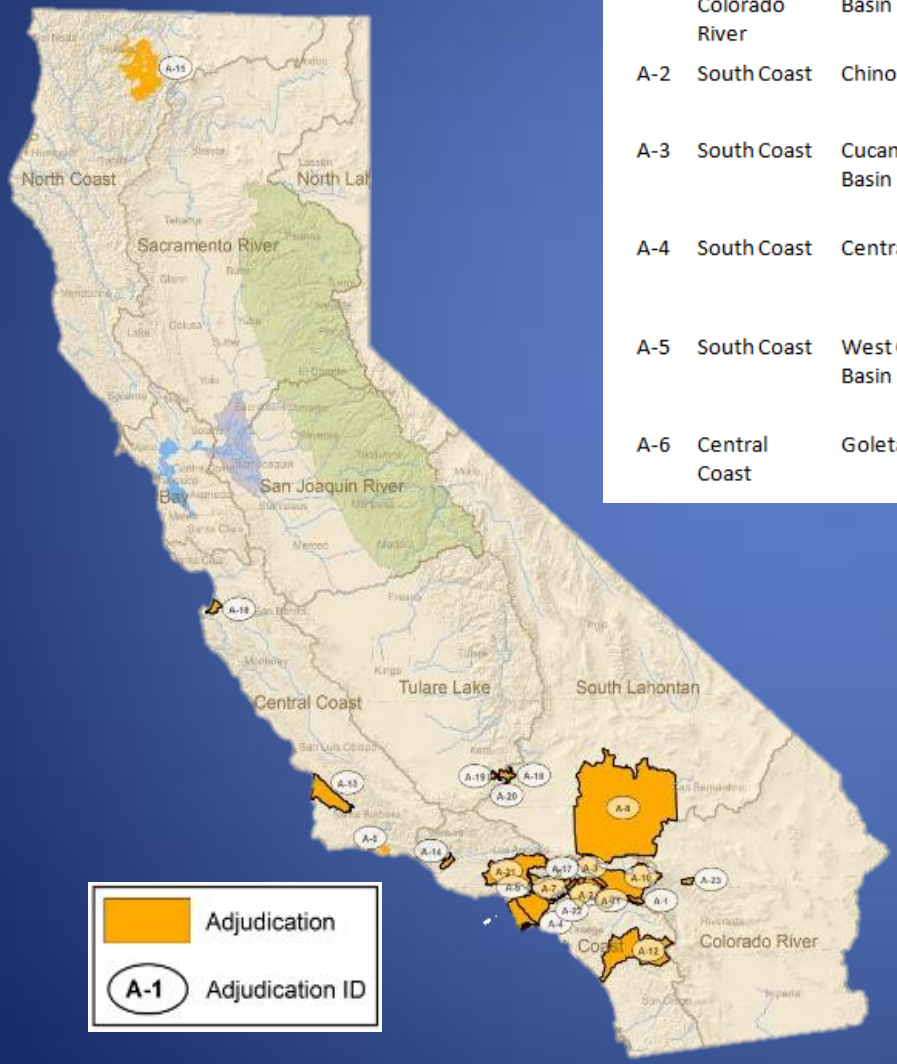
What's Not?



Hydrologic Region	# Active Conjunctive Management Programs
North Coast	0
San Francisco Bay	4
Central Coast	5
South Coast	32
Sacramento River	3
San Joaquin River	5
Tulare Lake	37
North Lahontan	0
South Lahontan	2
Colorado River	1
TOTAL PROGRAMS	**89**



Statewide Adjudications



ID	Hydrologic Region	Court Judgment	Basin No.	County	Judgment Date	Watermaster and/or website
A-1	South Coast, Colorado River	Beaumont Basin	7-21.04, 8-2.08	Riverside	2004	Beaumont Basin Watermaster
A-2	South Coast	Chino Basin	8-2.01	Riverside, San Bernardino	1978	Chino Basin Watermaster
A-3	South Coast	Cucamonga Basin	8-2.02	San Bernardino	1978	not yet appointed; operated as a part of Chino Basin
A-4	South Coast	Central Basin	4-11.04	Los Angeles	1965	CA Department of Water Resources - Southern Region
A-5	South Coast	West Coast Basin	4-11.03	Los Angeles	1961	CA Department of Water Resources - Southern Region
A-6	Central Coast	Goleta Basin	3-16	Santa Barbara	1989	Goleta Water District

- **23 Adjudicated Basins**
- **Coverage**
  - **6,900 square miles**
  - **4% of California**

Conclusion
Collaboration is Key

- Align efforts on:
  - Monitoring
  - Access to data
  - Modeling GW changes
  - Modeling GW-SW interaction
- Collaboration is especially important in this critically short water year.